IN THE CLAIMS

Please amend the claims as follows:

1. (Original) A method comprising:

for each ear of a subject,

turning off vestibular responses in one ear of the subject;

evaluating vestibular response in the other ear of the subject; and

analyzing the vestibular responses from each ear to characterize an asymmetry of an inner ear balance function.

2. (Original) The method of claim 1, wherein turning off vestibular responses in one ear includes applying a stimulus having a first component directed to essentially completely inhibit activity in a semicircular canal of the one ear.

3. (Original) The method of claim 2, wherein evaluating vestibular response in the other ear includes applying the stimulus having a second component directed to probing a canal function of the other ear.

4. (Original) The method of claim 3, wherein applying the stimulus includes applying the stimulus to a device that rotates a seated subject about a vertical axis.

5. (Original) The method of claim 3, wherein applying the stimulus includes applying the stimulus to a clinical rotation chair.

6.-102. (Cancelled)

103. (New) The method of claim 1 includes:

applying a stimulus to control motion of a device that rotates ~~a~~ the subject about an axis, the stimulus having a bias component to control the motion of the device to temporarily turn off vestibular responses in the one ear of the subject and having a probe component to modulate the

bias component while the vestibular responses in the one ear are turned off to evaluate responsiveness in the another ear of the subject.

104. (New) The method of claim 103, wherein the method further includes applying the stimulus in a substantially completely dark room.

105. (New) The method of claim 103, wherein the method further includes applying the stimulus in a substantially dark room having an illuminated visual target.

106. (New) The method of claim 103, wherein applying a stimulus includes applying the stimulus with the probe component having a frequency higher than that of the bias component and an amplitude lower than that of the bias component

107. (New) The method of claim 103, wherein applying a stimulus includes applying the stimulus with the bias component of the stimulus including a sinusoidal waveform and the probe component of the stimulus including a sinusoidal waveform.

108. (New) The method of claim 107, wherein applying the stimulus includes applying the stimulus with the bias component having a frequency less than or equal to 0.1 Hz and the probe component having a frequency of about 1 Hz.

109. (New) The method of claim 107, wherein applying the stimulus includes applying the stimulus with the bias component having an amplitude between about 150° per second peak velocity and about 250° per second peak velocity, and the probe component has an amplitude between about 10° per second peak velocity and about 20° per second peak velocity.

110. (New) The method of claim 103, wherein applying a stimulus includes applying the stimulus with the bias component of the stimulus including a pulse waveform and a step waveform and the probe component of the stimulus including a sinusoidal waveform.

111. (New) The method of claim 110, wherein applying the stimulus includes applying the stimulus with the probe component of the stimulus added to the acceleration step waveform of the bias component.

112. (New) The method of claim 110, wherein applying the stimulus includes applying the stimulus with the bias component of the stimulus including an acceleration pulse waveform of a first duration and a step waveform of a second duration, the second duration longer than the first duration.

113. (New) The method of claim 112, wherein applying the stimulus includes applying the stimulus with the bias component of the stimulus including the acceleration pulse waveform having about a $400°/s^2$ amplitude lasting about 1 second and the acceleration step waveform having about a $30°/s^2$ amplitude lasting about 4 seconds.

114. (New) The method of claim 113, wherein applying the stimulus includes applying the stimulus with the probe component of the stimulus including a sinusoidal waveform having a frequency of about 1 Hz and an amplitude of about 20°/s peak velocity added to the acceleration step waveform of the bias component.

115. (New) The method of claim 103, wherein the method further includes:

isolating bias responses to the bias component of the stimulus from probe responses to the probe component of the stimulus; and

analyzing separately the bias responses and the probe responses.

116. (New) The method of claim 115, wherein isolating bias responses from probe responses includes measuring eye movements resulting from applying the stimulus to control motion of the device.

117. (New) The method of claim 103 includes:

computing eye velocity from eye position data from the subject as a result of applying the

stimulus;

isolating a bias response to the bias component of the stimulus, the bias response isolated from a probe response to the probe component of the stimulus; and

analyzing separately the bias response and the probe response.

118. (New) The method of claim 117, wherein the method further includes

obtaining a slow-phase eye velocity;

bandpass filtering the slow-phase eye velocity to isolate the probe response providing a bandpass slow-phase eye velocity; and

parameterizing the probe response.

119. (New) The method of claim 118, wherein the method further includes averaging the bandpass slow-phase eye velocity over a number of cycles of the bias component and parameterizing the averaged bandpass slow-phase eye velocity.

120. (New) The method of claim 119, wherein parameterizing the averaged bandpass slow-phase eye velocity includes using a curve fit of the averaged bandpass slow-phase eye velocity, $\left\langle \hat{\dot{\theta}}_{bp} \right\rangle$, the curve fit related to a probe frequency, ω_p, and a bias frequency, ω_b, and having a probe component eye velocity amplitude, A_p, a probe component phase, φ_p, a phase of the modulation waveform, φ_b, and a modulation factor, m, that varies from 0 to 1, as fit parameters.

121. (New) The method of claim 120, wherein using a curve fit includes using the curve fit according to the relation

$$\left\langle \hat{\dot{\theta}}_{bp} \right\rangle = A_p\left(1 + m\cos(\omega_b t + \varphi_b)\right)\cos(\omega_p t + \varphi_p).$$

122. (New) The method of claim 118, wherein bandpass filtering the slow-phase eye velocity includes filtering the slow-phase eye velocity using a bandpass filter of about 0.5 Hz to about 5 Hz.

123. (New) The method of claim 119, wherein the bandpass slow-phase eye velocity is averaged over five 0.1 Hz cycles.

124. (New) The method of claim 117, wherein the method further includes

obtaining a slow-phase eye velocity and a stimulus velocity;

low-pass filtering the slow-phase eye velocity to remove the probe response providing a low-pass slow-phase eye velocity;

low-pass filtering the stimulus velocity to remove the probe component providing a low-pass bias velocity; and

obtaining an input-output function correlated to the low-pass slow-phase eye velocity vs the isolated bias component.

125. (New) The method of claim 124, wherein the method further includes averaging the low-pass slow-phase eye velocity and the low-pass bias velocity over a number of cycles of the bias component.

126. (New) The method of claim 125, wherein obtaining an input-output function includes:

estimating a phase for the averaged isolated bias component and a phase for the averaged low-pass slow-phase eye velocity at a frequency of the bias component; and

time shifting the averaged isolated bias component and the averaged low-pass slow-phase eye velocity such that the two are aligned with a 180° phase shift between them, after estimating the phase for the averaged isolated bias component and the phase for the averaged low-pass slow-phase eye velocity.

127. (New) The method of claim 126, wherein the method further includes determining a curve fit to the averaged low-pass slow-phase eye velocity, $\left\langle \hat{\theta}'_{lp} \right\rangle$, related to the averaged low-pass bias velocity, $\langle \omega'_{lp} \rangle$, the curve fit having fit parameters K related to gain behavior of the input-output function and β related to a saturation behavior of the input-output function.

128. (New) The method of claim 126, wherein determining a curve fit includes determining the curve fit according to the relation

$$\left\langle \hat{\theta}'_{lp} \right\rangle = \frac{K\left(1 - e^{-\beta\langle \omega'_{lp} \rangle}\right)}{1 + e^{-\beta\langle \omega'_{lp} \rangle}}.$$

129. (New) The method of claim 124, wherein low-pass filtering the slow-phase eye velocity includes filtering the slow-phase eye velocity using a low-pass filter having about a 0.5 Hz cutoff.

130. (New) The method of claim 124, wherein the low-pass slow-phase eye velocity is averaged over five 0.1 Hz cycles.

131. (New) The method of claim 124, wherein the method further includes determining deviations of the input-output function from a straight line.

132. (New) A computer-readable medium having computer-executable instructions for performing a method comprising:

for each ear of a subject,

turning off vestibular responses in one ear of the subject;

evaluating vestibular response in the other ear of the subject; and

analyzing the vestibular responses from each ear to characterize an asymmetry of an inner ear balance function.

133. (New) The computer-readable medium of claim 132, wherein the computer-readable medium has computer-executable instructions for performing a method comprising:

applying a stimulus to control motion of a device that rotates the subject about an axis, the stimulus having a bias component to control the motion of the device to temporarily turn off vestibular responses in one ear of the subject and having a probe component to modulate the bias component while the vestibular responses in the one ear are turned off to evaluate responsiveness in another ear of the subject.

134. (New) The computer-readable medium of claim 133, wherein applying a stimulus includes applying the stimulus with the probe component having a frequency higher than that of the bias component and an amplitude lower than that of the bias component

135. (New) The computer-readable medium of claim 133, wherein applying a stimulus includes applying the stimulus with the bias component of the stimulus including a sinusoidal waveform and the probe component of the stimulus including a sinusoidal waveform.

136. (New) The computer-readable medium of claim 135, wherein applying the stimulus includes applying the stimulus with the bias component having a frequency less than or equal to 0.1 Hz and the probe component having a frequency of about 1 Hz.

137. (New) The computer-readable medium of claim 133,wherein applying a stimulus includes applying the stimulus with the bias component of the stimulus including a pulse waveform and a step waveform and the probe component of the stimulus including a sinusoidal waveform.

138. (New) The computer-readable medium of claim 137, wherein applying the stimulus includes applying the stimulus with the probe component of the stimulus added to the acceleration step waveform of the bias component.

139. (New) The computer-readable medium of claim 137, wherein applying the stimulus includes applying the stimulus with the bias component of the stimulus including an acceleration pulse waveform of a first duration and a step waveform of a second duration, the second duration longer than the first duration.

140. (New) The computer-readable medium of claim 133, wherein the computer-executable instructions for performing the method further includes:

isolating bias responses to the bias component of the stimulus from probe responses to the probe component of the stimulus; and

analyzing separately the bias responses and the probe responses.

141. (New) The computer-readable medium of claim 140, wherein isolating bias responses from probe responses includes measuring eye movements resulting from applying the stimulus to control motion of the device.

142. (New) The computer-readable medium of claim 133, wherein the computer-readable medium has computer-executable instructions for performing a method comprising:

obtaining eye velocity generated from eye position data from the subject as a result of applying the stimulus;

isolating a bias response to the bias component of the stimulus, the bias response isolated from a probe response to the probe component of the stimulus; and

analyzing separately the bias response and the probe response.

143. (New) The computer-readable medium of claim 142, wherein the computer-executable instructions for performing the method further includes parameterizing a bandpass slow-phase eye velocity generated from isolating the probe response with respect to an acquired a slow-phase eye velocity by bandpass filtering the slow-phase eye velocity.

144. (New) The computer-readable medium of claim 143, wherein parameterizing a bandpass slow-phase eye velocity includes parameterizing an averaged bandpass slow-phase eye velocity obtained from averaging the bandpass slow-phase eye velocity over a number of cycles of the bias component.

145. (New) The computer-readable medium of claim 144, wherein parameterizing the averaged bandpass slow-phase eye velocity includes using a curve fit of the averaged bandpass slow-phase eye velocity, $\left\langle \hat{\dot{\theta}}_{bp} \right\rangle$, the curve fit related to a probe frequency, ω_p, and a bias frequency, ω_b, and having a probe component eye velocity amplitude, A_p, a probe component phase, φ_p, a phase of the modulation waveform, φ_b, and a modulation factor, m, that varies from 0 to 1, as fit parameters.

146. (New) The computer-readable medium of claim 145, wherein using a curve fit includes using the curve fit according to the relation

$$\left\langle \hat{\theta}_{bp} \right\rangle = A_p\left(1 + m\cos\left(\omega_b t + \varphi_b\right)\right)\cos\left(\omega_p t + \varphi_p\right).$$

147. (New) The computer-readable medium of claim 142, wherein the computer-executable instructions for performing the method further includes obtaining an input-output function correlated to a low-pass slow-phase eye velocity vs an isolated bias component, the low-pass slow-phase eye velocity generated from low-pass filtering a slow-phase eye velocity, the low-pass bias velocity generated from low-pass filtering a stimulus velocity of the stimulus.

148. (New) The computer-readable medium of claim 147, wherein the input-output function is correlated to an averaged low-pass slow-phase eye velocity and an averaged low-pass bias velocity, the averaged low-pass slow-phase eye velocity and the averaged low-pass bias velocity obtained by averaging the low-pass slow-phase eye velocity and the low-pass bias velocity over a number of cycles of the bias component.

149. (New) The computer-readable medium of claim 148, wherein the computer-executable instructions for performing the method further includes:

estimating a phase for the averaged low-pass bias velocity and a phase for the averaged low-pass slow-phase eye velocity at a frequency of the bias component; and

time shifting the averaged low-pass bias velocity and the averaged low-pass slow-phase eye velocity such that the two are aligned with a 180° phase shift between them, after estimating the phase for the averaged isolated bias component and the phase for the averaged low-pass slow-phase eye velocity.

150. (New) The computer-readable medium of claim 149, wherein the computer-executable instructions for performing the method further includes, after time shifting the averaged low-pass bias velocity and the averaged low-pass slow-phase eye velocity, determining a curve fit to the

averaged low-pass slow-phase eye velocity, $\left\langle \hat{\dot{\theta}}'_{lp} \right\rangle$, related to the averaged low-pass bias velocity, $\langle \omega'_{lp} \rangle$, the curve fit having fit parameters K related to gain behavior of the input-output function and β related to a saturation behavior of the input-output function.

151. (New) The computer-readable medium of claim 150, wherein determining a curve fit includes determining the curve fit according to the relation

$$\left\langle \hat{\dot{\theta}}'_{lp} \right\rangle = \frac{K\left(1 - e^{-\beta\langle \omega'_{lp} \rangle}\right)}{1 + e^{-\beta\langle \omega'_{lp} \rangle}}.$$

152. (New) The computer-readable medium of claim 147, wherein the computer-executable instructions for performing the method further includes determining deviations of the input-output function from a straight line.